a detector that detects a two-dimensional distribution of a diffraction pattern of the light exiting from a fiber lens at a proximal end of the optical fiber;

an arc fuser that fuses the fiber lens; and

a controller that activates the arc fuser in response to the two-dimensional distribution of the diffraction pattern detected by the detector.

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10. (amended) A system as claimed in claim 8, wherein the detector is positioned relative to the fiber lens to detect a far-field diffraction pattern.

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13. (cancelled)

Remarks:

Claims 1-12, 14, and 15 are pending in this application. Claims 1, 2, 8, and 10 have been amended in various particulars as indicated hereinabove. Claim 13 has been cancelled without prejudice or disclaimer.

Each of the two independent claims requires the detection of the two-dimensional diffraction pattern and fusing the fiber lens in response to this two-dimensional distribution.

This operation is a key feature of the invention. It allows the shaping of the lens to maximize coupling efficiency, for example. One specific example arises when coupling to pump chips that can have elliptical far-field patterns.

The claims were reject as being obvious or anticipated by the Honmou patent. The Fanning patent was additionally cited relative to Claims 6, 12, 14, and 15. Neither of these references shows or suggests the claimed operation.

For example, the Honmou patent controls fusing based on the one dimensional, diameter parameter. Column 3, lines 55-60 and the Fig. 4 inset show how only the one dimensional, diameter parameter is relevant, rather than the two dimensional distribution, or more specifically the aspect ratio, as required by the instant claims. Specifically, the Honmou patent teaches to fuse until a specified FWHM diameter is achieved.

It cannot be obvious to do something that is not shown or suggested. Moreover, many times the attainment of a high coupling efficiency requires the control of the lens profile in two-dimensions. This is not recognized by the applied references. Thus, the present claimed invention is both different from and achieves better performance than the systems disclosed in the references.

The Fanning patent, being merely cited for pulsed fusing, fails even to show emission pattern detection.

For these reasons, the Applicants request withdrawal of the art rejections.

The rejection under 35 U.S.C. 101 is moot in view of the abandonment of the 09/740,430 application.

Attached hereto is a marked-up version of the changes made to the claims by the instant amendments. The attached appendix is captioned "Version with Markings to Show Changes Made." Please note that due to the amendments, the page and line numbers may be different from the specification as originally filed.

Applicants believe that the present application is in condition for allowance. A Notice of Allowance is respectfully solicited. Should any questions arise, the Examiner is encouraged to contact the undersigned.

Respectfully submitted,

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Version with Markings to Show Changes Made

CLAIMS

What is claimed is:

1. (amended) A method for fusing an optical fiber lens, comprising:
injecting light into an optical fiber;
detecting a diffraction pattern of the light exiting from a fiber lens at a proximal end of the optical fiber; and
electro-fusing the fiber lens in response to a two-dimensional distribution of the diffraction pattern.

2. (amended) A method as claimed in claim 1, wherein the step of injecting the light into the optical fiber comprises energizing a laser that is coupled to a distal end of the optical fiber.

3. A method as claimed in claim 1, wherein the step of detecting the diffraction pattern comprises detecting a far-field diffraction pattern.

4. A method as claimed in claim 1, wherein the step of detecting the diffraction pattern comprises positioning a two-dimensional detector optically in front of the fiber lens.

5. A method as claimed in claim 1, further comprising analyzing a two-dimensional distribution of the diffraction pattern.

6. A method as claimed in claim 5, wherein the step of analyzing the diffraction pattern comprised determining a ratio of a lateral size to a transverse size of the diffraction pattern.

7. A method as claimed in claim 1, wherein the step of fusing the fiber lens comprises exposing the fiber lens to an electrical arc.

Version with Markings to Show Changes Made

8. (amended) A system for fusing an optical fiber lens, comprising:

a light source that injects light into an optical fiber;

a detector that detects a two-dimensional distribution of a diffraction pattern of the light exiting from a fiber lens at a proximal end of the optical fiber;

an arc fuser that fuses the fiber lens; and

a controller that activates the arc fuser in response to the two-dimensional distribution of the diffraction pattern detected by the detector.

9. A system as claimed in claim 8, wherein the light source comprises a laser that is coupled to a distal end of the optical fiber.

10. (amended) A system as claimed in claim 8, wherein the detector is positioned relative to the fiber lens to detect a far-field diffraction pattern.

11. A system as claimed in claim 8, wherein the detector is positioned greater than 0.5 centimeters from the fiber lens.

12. A system as claimed in claim 8, wherein detector comprises a camera.

13. (cancelled) ~~A system as claimed in claim 8, wherein the controller determines a two-dimensional distribution of the diffraction pattern.~~

14. A system as claimed in claim 8, wherein the controller determines a ratio of a lateral size to a transverse size of the diffraction pattern.

15. A system as claimed in claim 8, wherein the controller activates the arc fuser in a pulsed fashion until a desired diffraction pattern is detected by the detector.